FAA | AVIATION NEWS

February 1963

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FAA | AVIATION NEWS
FEDERAL AVIATION AGENCY

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TOWARD A COMMON GOAL

Last year the FAA held a series of Air Share meetings across the country, seeking airmen's views on subjects they thought important as well as what the Agency thought was important.

These meetings were augmented by a number of hangar flying sessions in which FAA Administrator N. E. Halaby exchanged views with airmen, answering their questions and expressing his own philosophy.

Continuing this program of give-and-take, the FAA last month began a series of week-long seminars at the FAA Academy in Oklahoma City. The seminar (*see* page 5) was designed to acquaint aviation officials and leaders with all the complex components which comprise aviation today, critical areas in which they may have no real knowledge despite their aviation background. The first group happened to be composed of airline representatives. It is planned that subsequent audiences will include representatives from all parts of the aviation community, among them the Civil Aeronautics Board and military and general aviation.

Objective of this seminar, as well as the previous sessions, was, as Mr. Halaby described it, to "make aviation a creative, cooperative effort."

Whether the objective was reached entirely is not up to FAA to say, but we were particularly pleased with the reaction of R. I. Francis, Captain, Operations, Northeast Airlines Inc.:

"The course opened my eyes to the complexities of the vast National Aviation System. It rejuvenated my respect for each and every division we covered. It destroyed my image of the Federal Aviation Agency as a great ponderous government agency . . . devoid of flesh and blood and reasonable human beings."

It is obvious that working together has helped to bring civil aviation in this country to today's high state of development. The link that makes this a truly cooperative effort is the attainment of a goal—safety—sought by all who live in the world of flight.

The Agency is indeed grateful that the first conference on the National Aviation System at the FAA Academy is considered valuable by experienced men in aviation. We intend to continue the program, to improve it and hope that it will be increasingly important in the cooperative march on air safety.

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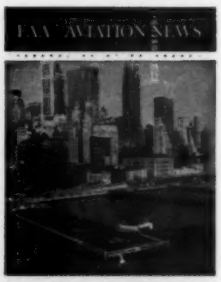

***COVER:** Heliport located in busy midtown New York capitalizes on helicopter's most important advantage—accessibility. (see page 8)*

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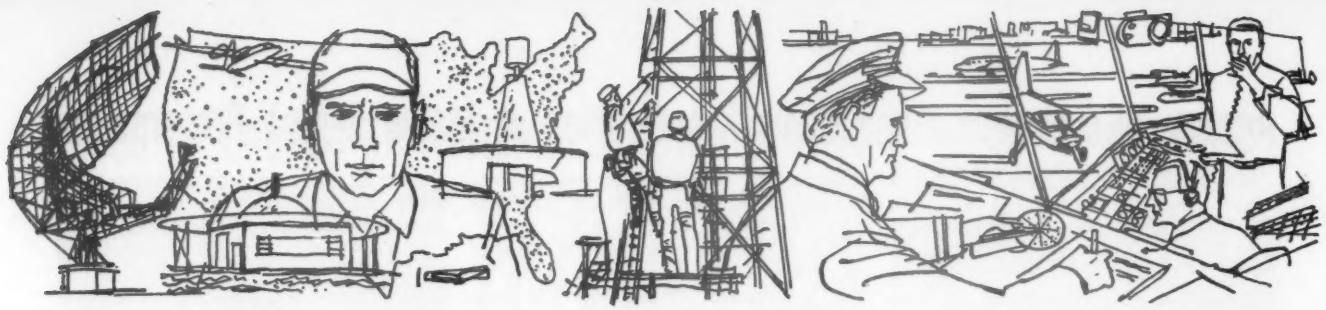


MORE ECONOMIC DATA SOUGHT BEFORE SUPERSONIC TRANSPORT DECISION

Should the United States build a supersonic transport airplane?

If so, what characteristics should it have? How fast should it go? What range? How many passengers? Would it require an "exotic" design of engine or airframe to meet flexible requirements from subsonic on up? How quickly can it be, or should it be, developed?

These are multi-million dollar questions, reckoned in terms of the development itself, the future fiscal health of the American airlines and aviation industry, and national and international economics.

A high-level advisory group has now called for the United States to proceed at once with development of the plane. FAA's ten-member Supersonic Transport Advisory Group provided recommendations in a 23-page report to FAA Administrator N. E. Halaby.

Halaby, accepting the report, said it made a "powerful" case for proceeding with SST development but in the areas of development and operating costs "the picture is still incomplete . . . and requires refinement." He requested the group to pursue its studies in these areas to aid him in preparing a recommendation for President Kennedy on "whether and, if so, how" the government should assist industry in developing the plane.

Retired Air Force Gen. Orval R. Cook, chairman of the group, underlined the report's findings in these words:

"The United States cannot afford to risk loss of its leadership in aviation with consequent negative effects upon its internal economy and its export trade by delaying development of a supersonic transport in the face of foreign competition already launched. We believe that the supersonic transport program should move forward as rapidly as technology will permit."

Halaby asked the Advisory Group to study the following specific problems and provide additional conclusions and recommendations by May 1, 1963:

1. Cost of development and test up to the preproduction stage.

2. Unit cost which would be charged to the air carriers by manufacturers after the production stage was reached, assuming for purposes of analysis that 200 aircraft are produced.

3. Direct operating costs.

4. Management organization for development of an SST.

Current findings included:

- A proposed SST development timetable under which engine and airframe competitions among manufacturers would be held by early 1964, two competing prototypes would be test-flying by 1967, and airline service following extensive flight proof test would begin in 1972.
- "Because of the high cost of development . . . financial assistance by the government is essential."
- An estimate that the aircraft's development costs would be in "the order of $1 billion," with cost per plane for an airline at about $20 million.
- A recommendation that development dollars provided by the government be reclaimed at least in substantial part by a royalty system.
- The appraisal of overseas competition: "The primary competitive forces are in the French-United Kingdom effort, which is completely subsidized by the respective governments. Although little is known at present concerning USSR competition, it should not be underestimated."
- "Establish Mach 3.5 as a planning goal" and further study the aircraft "for economical justification at supersonic cruising speeds in the range Mach 2.3 to 3.5."
- Range initially should be 2,400 nautical miles with a strong commitment to increase it later.
- Aircraft passenger capacity between 100 and 150 persons.
- In three key problem areas, the group called for a plane with "minimum operation costs consistent with safe, efficient operation and acceptable to the public," an engine noise level "no greater than that generated by present subsonic jet aircraft," and "a mission profile that will result in sonic overpressure (or boom) at ground level that will be acceptable to the public."

Gen. Orval R. Cook

Paralleling the Advisory Group SST study since 1961 has been a government-industry technical and economic research program. FAA, the National Aeronautics and Space Administration, and the Department of Defense are governmental partners in the program, with FAA providing program leadership. Congress appropriated $11 million in fiscal year 1962 and $20 million in fiscal year 1963 to FAA for contract research. A family of some thirty contractors has been conducting studies in aerodynamics, propulsion, structures, materials, operations, and economic and market problems, with results continuously made available to government and industry.

Over-all aim of this research and study effort has been to ascertain whether it is both feasible and advisable on economic and technical grounds, as well as in the national interest, for government and industry to join in developing a supersonic airplane for airline operation in the early 1970's. Halaby will make a recommendation to the White House in this connection by the middle of this year.

The Supersonic Transport Steering Group headed by Halaby, to whom the report was addressed, includes Dr. Brockway McMillan, Assistant Secretary of the Air Force for Research and Development, and Charles Zimmerman, Director of Aeronautical Research, NASA.

Agency R&D Progress and Goals Are Outlined at Status Report Presentation

One of FAA's major goals in the years directly ahead is development of an all-weather automatic landing system suitable for civil aircraft operations. The objective, it is felt, can best be met with a technique that utilizes an improved Instrument Landing System (ILS) to the fullest possible extent. An FAA DC-7 equipped with a radio altimeter is conducting extensive automatic landing tests, and this system can now be considered "the generic sample for future use."

According to present plans, FAA's Systems Research and Development Service will be able to set down requirements for a suitable automatic landing system, one subject to refinement with the passage of time, during the coming year. The next step would be to install this type of system in a turbojet aircraft for further testing.

Plans call for a suitable system to be past this development stage by 1966. Paralleling this development effort, which will primarily serve the large aircraft types at least initially, Agency development blueprints also call for the provision of letdown and approach facilities for an increased portion of the aviation population. A program is now under way to produce a lower cost ILS appropriate for use at smaller airports.

The facility will provide the same operational performance as standard ILS, but will be designed specifically for lower-density fields where continuous, 24-hour-a-day operation is not a necessity. The cost reduction will be achieved through simplified monitoring systems and less complex structural design.

Estimated price tag on this equipment, schedued for completion by this summer, is $80,000 in contrast to the $276,460 figure for today's standard ILS.

These hardware plans were outlined at an FAA development status-report to top government officials and the aviation community in Washington late in January.

The three FAA services engaged in research and development outlined their programs in two three-hour sessions. The first was for Members of Congress and the upper echelon of FAA's sister government agencies, the second for representatives of a broad cross-section of the aviation community — airlines, general aviation, pilots, manufacturers, trade associations—and interested members of the general public.

The Aircraft Development Service, which conducts the supersonic transport research program, reviewed an over-all mission under which it is also conducting work that ranges from the strength of seat belts to participation in a V/STOL development program with the Defense Department.

Aim of FAA participation, here and in the case of the Air Force C-141 jet cargo plane, is civil certification where compatible with military requirements of the craft. Other programs discussed included Project Little Guy, which is developing a simplified cockpit for light aircraft and the DC-3 replacement program.

The Aviation Medical Service dealt with human factors research in physiological, psychological, medical, and operational proficiency areas. AMS establishes medical standards for civil aviation. Among research areas: establishment of human factors criteria for selection of air traffic controllers, effects of aging on pilots, possible effects of some commonly used drugs on pilot efficiency and methods of preventing serious physical injuries in the event of aircraft accidents.

The Systems Research and Development Service reported the state of progress in development of systems and equipment for improvement of the nation's airways in line with the Project Beacon recommendations by a Presidential task force in 1961.

R&D presentation shows antenna, other hardware in VHF test program. For related story, see page 11.

President Requests $810 Million To Operate FAA in Fiscal 1964

The President's budget in Congress requests $810,100,000 to operate the Federal Aviation Agency for the fiscal year beginning July 1, 1963. This is an increase of $53,747,000 over the current year.

Included in the budget is provision for an additional 1,010 employees, the majority of them air traffic controllers, engineers and inspectors.

FAA also proposes to ask Congress to continue the Federal Aid Airport Program at the current annual rate of $75 million.

The budget estimate includes $15 million to begin construction of permanent facilities to house operations of the National Aviation Facilities Experimental Center (NAFEC) at Atlantic City, N. J., where research and development activities are conducted. To finance R&D work, $50 million was requested for scientific research.

Legislation has been recommended to establish a Federal corporation to operate Washington National and Dulles International Airports. If it is enacted, revenues from these two airports would be applied to operating costs of the airports and payments of interest on the government's investment in the airports. At present, this revenue is returned to the Treasury.

The President also is recommending a system of user charges for aviation to help recover, at least in part, the cost of operating the National Airways System. His proposal provides for continuing the present tax on transportation of persons. In addition, the present tax of two cents per gallon on aviation gasoline will be extended to jet fuels, and the tax on general aviation fuel will be raised to three cents a gallon. The proposal also provides a five percent air freight tax. User charges would become effective January 1, 1964.

INDUSTRY BRIEFED ON NATIONAL AVIATION SYSTEM

The first in a series of five-day seminars on the National Aviation System was held last month at the FAA Academy in Oklahoma City.

Attending this program, designed to aid industry-government development of the National Aviation System, were representatives from 15 airlines and the Air Line Pilots Association.

Under study were today's and tomorrow's aircraft, the role of airports and their design, navigation aids, weather information, rules and flight procedures, air traffic control, human factors in aviation and the pilot and the crew.

In opening the session, FAA Administrator N. E. Halaby told the participants, "We are trying to broaden the perspective and give system scope to the understanding of crewmen and managers of the air carrier industry in a positive search for safety. To me the aviation community is composed of three major categories of users of airspace—the traveler, the shipper, and those who pilot.

"I'd like to see as much safety competition as there is advertising competition. We should make aviation a creative, cooperative thing rather than controversial.

"I don't think any one of us has the right to draw pay in this business unless he goes home at night having produced better services each day."

The course opened with a look at the air traffic systems (*see photos*). The 17 participants were given an opportunity to handle traffic—simulated in the effective radar terminal laboratories of the Academy. This gave them a close look and use of the radar tools currently used for arrival and departure control and hand-off to the Air Route Traffic Control Centers.

W. J. Schulte, head of FAA's Office of General Aviation Affairs, explained the mission of his office and the relationship of today's and tomorrow's general aviation with air carrier operations.

The participants were given a glimpse of the National Airspace Utilization System for the future, how airspace can best be used by all of aviation and what equipment is being developed for both airborne and ground use to facilitate flights ranging from the 100-knot small plane to the supersonic transport.

Within the area of aviation medicine, participants heard the Civil Aeromedical Research Institute Director, Dr. Stanley Mohler, explain the current studies on aging factors in airmen, crash survival studies and other aspects of aviation medicine dealing with seating configuration in air carrier jets.

A similar course on the National Aviation System will be presented each month to other aviation groups. They will include every group from the fixed base operator to the general aviation pilot, from state aeronautics commissions to the airport manager.

Veteran Airline Pilot Advises FAA On All-Weather Landing System

Captain Robert Buck

Captain Robert N. Buck, 49, supervisor of flight for Trans World Airlines, has completed a 30-day stint as consultant to FAA Administrator N. E. Halaby to study the Agency's all-weather landing system program (*see* page 4).

Buck, well-known pilot and weather authority, has been on loan from TWA as an advisor in FAA's long-range program to improve safety and reliability of present approach and landing capabilities and in the development of a future program to achieve zero-zero landing capabilities for airline and general aviation aircraft.

Captain Buck, who began flying at 15, has been with TWA since 1937. During World War II, he was cited by the Air Force for his pioneering work in weather studies. The TWA captain is a member of the Supersonic Transport Advisory Group, a committee of aviation leaders who recently made recommendations to FAA on the need to proceed with a commercial supersonic transport program (*see* page 3). He is a member of the Meteorological Sub-Committee of the National Advisory Committee for Aeronautics, the Institute of Aeronautical Sciences, and the Institute of Navigation, and also is associate editor of Air Facts and a contributor to Reader's Digest.

Distance Measuring Equipment Regulation Goes into Effect Beginning July 1

All civil aircraft flying Instrument Flight Rules above 24,000 feet will be required to have Distance Measuring Equipment (DME) beginning July 1, 1963, under a new FAA regulation. This includes both general aviation and the airlines.

In addition, all airline aircraft operating IFR, regardless of altitude, will be required to have this equipment beginning with: (1) turbojets on July 1, 1963; (2) turboprops on January 1, 1964; (3) pressurized piston-engine airplanes on July 1, 1964; and (4) other airplanes having a maximum takeoff weight above 12,500 pounds on July 1, 1965.

DME will not be mandatory on general aviation aircraft flying IFR below 24,000 feet until such time as the FAA determines a safety need for such installations, there is an adequate supply of satisfactory general aviation DME, and availability of sufficient ground facilities compatible with the airborne equipment to cover the lower altitude airways.

Initially, the new rule will apply to the 48 contiguous states. Hawaii and Alaska will be added at such times as compatible ground facilities become available in those states.

FAA Sleuths Seek to Improve 97 Percent Facility Performance

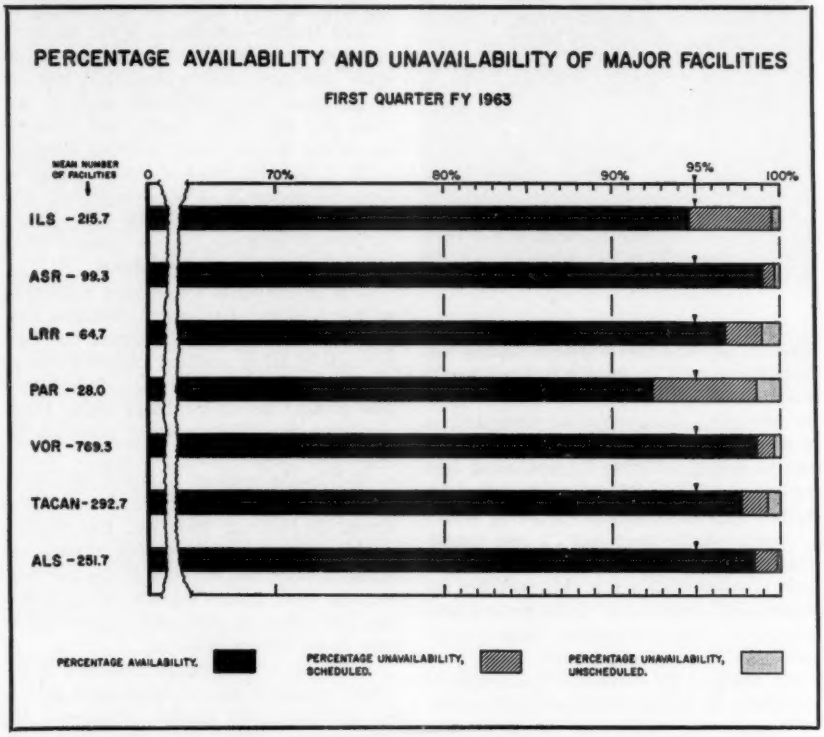
FAA's Systems Maintenance Service is taking a fresh look at when and why, on rare occasions, its traffic control and navigation facilities become inoperative. Not satisfied with 97 percent over-all reliability (*see* chart), FAA is attacking the remaining three percent.

FAA facilities covered by these reports include 215 Instrument Landing Systems (ILS), 99 Airport Surveillance Radar Systems (ASR), 64 Long Range Radars (ARSR), 28 Precision Approach Radars (PAR), 769 short range navigation systems (VOR), 292 distance and azimuth measuring equipments (TACAN) and 251 Airport Lighting Systems (ALS). Availability of these facilities in the months July through September 1962 was approximately 97 percent; 2.5 percent unavailability was due to scheduled maintenance shutdowns. Only one-half of one percent was due to equipment failure.

First step is a new "Facility Outage and Failure Report" form which will be filled out by FAA field maintenance technicians and forwarded to Washington when malfunctions, failures or scheduled outages occur at any facility. Details in the reports will lead not only to detection of components subject to frequent failure, but also will identify component manufacturers. The problem, once identified, will be followed by corrective action.

If analysis of the reports reveals system weaknesses, FAA will weigh the cost of system modification against the benefits to be gained. If modifications are indicated, FAA Systems Maintenance Service will work with the Systems Design Team in the Agency's Aviation Research and Development Service—and other FAA Services—to develop new designs.

Total effect of the new reporting program will enable FAA to constantly improve the reliability of its facilities.



LEGEND

ILS Instrument Landing System
ASR Airport Surveillance Radar
LRR Long Range Radar also known as Air Route Surveillance Radar
PAR Precision Approach Radar
VOR Very High Frequency Omnidirectional Radio Range
TACAN Tactical Air Navigation
(VOR and TACAN facilities, co-located, form the VORTAC system, the standard international short range air navigation system)
ALS Approach Light System

New Regulation Prohibits Non-Essential Flying around Disaster Areas

Flying in disaster areas will be prohibited beginning next month except for aircraft on official business in connection with the disaster.

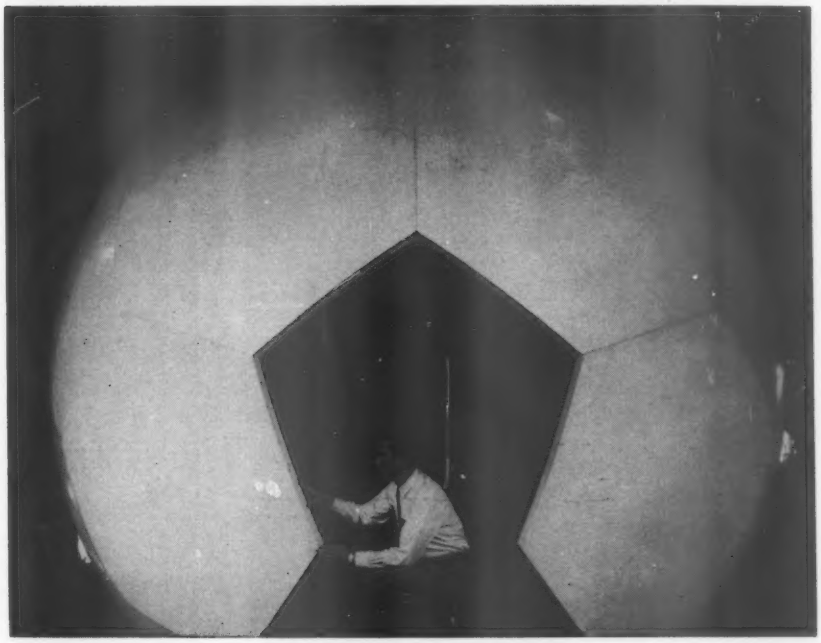
Effective March 20, a Civil Air Regulation goes into effect prohibiting non-essential flights below 2,000 feet above the surface and within five miles of an area designated by FAA as a disaster area as a result of aircraft accidents, train wrecks, forest fires, earthquakes, floods and similar disasters. The area will be designated through a NOTAM giving location and dimensions.

Purpose of the rule is to prevent sightseeing aircraft from gathering in the area and creating an air traffic situation that might result in a mid-air collision. The rule also is intended to eliminate all other non-essential aircraft from the area in order that rescue and relief operations may be carried out safely and efficiently.

Planes carrying newsmen and persons on official business will be permitted in the area, provided they obtain prior approval from the agency responsible for search or rescue operations.

The rule makes provision for non-essential aircraft to fly through the area if they are operating to or from an airport located within the area. Such flights would operate in such a way so as to avoid endangering or hampering relief operations. Aircraft will be permitted to operate through the area when specifically authorized under an IFR clearance.

Rigid Radomes Evaluated for Use with ASDE Radar



If FAA tests now under way prove satisfactory, rigid radomes may replace the inflatable type now in use to house radar antennas which scan surface traffic at the nation's major airports.

Although rigid radomes are employed on more powerful, longer range radar, present Airport Surface Detection Equipment (ASDE) uses inflatable rubber domes to cover the antenna in order that the lower powered, shorter wave signals can penetrate the protective covering. Inflatable radomes must be maintained under air pressure and are subject to collapse from storm damage—and even boys with rifles who find them attractive targets.

The new radome, developed under an FAA contract with Airborne Instrument Laboratories, is made of polyurethene, a plastic developed by Goodyear. Foamed plastic is molded into pentagonal and hexagonal curved sections, two inches thick and about five feet wide, and bonded together to form a finished radome.

ASDE is a high resolution, short range radar that provides a scope image of runways, taxiways, aircraft and obstacles to help controllers direct surface traffic.

NEW PUBLICATION ASSISTS GENERAL AVIATION WITH FUNDAMENTALS

Rules of Flight, a new, easy-to-read publication designed to help everyone in general aviation, has been produced by FAA.

The 64-page illustrated booklet of selected Civil Air Regulation and Federal Air Regulation material briefly describes the requirements for pilot certification and ratings, rules of the air, air traffic control, aircraft registration, airworthiness certificates and maintenance and inspection requirements. It also tells where detailed information may be obtained.

In addition, the pamphlet contains information on obtaining additional aircraft ratings, replacing lost or destroyed certificates, how to report an accident, location of General Aviation District Offices, written examination guides, flight test guides, aviation statistics, nautical miles conversion tables, a cruising altitude chart and other material.

Of interest to pilots, aircraft owners, mechanics, and those thinking about joining the ranks of those who fly, the publication is well-illustrated with pictures, charts and diagrams supplementing the simplified text that explains the rules of aircraft operation.

Rules of Flight may be obtained for 55 cents from the Superintendent of Documents, Washington 25, D. C. Previously published were *Facts of Flight, Realm of Flight,* and *Path of Flight.*

AIRPORT AID DEADLINE NEARS

February 15 is the deadline for communities planning to build airports or improve existing ones to submit their requests for financial help under the 1964 fiscal year Federal Aid Airport Program.

Requests should be sent to FAA District Airport Engineer Offices.

More than 29,000 Respond to Survey of Maintenance Airmen

More than 29,000 persons from all segments of aviation responded to the FAA's recent month-long survey of certificated maintenance airmen.

Survey forms are being reviewed and coded by FAA's Flight Standards Service and will be processed by Electric Accounting Machine. Preliminary results are expected to be ready in March.

The survey was conducted last November to obtain current information on the number of active certificate holders, industry utilization of these airmen, the types of equipment on which they work, and their activities and duties. This data is needed to bring the maintenance airmen certification and surveillance program into greater alignment with the responsibilities of maintaining modern complex aircraft.

Information from the survey will be similar to that which will be obtained from the Agency's proposed renewal program for all airmen certificates. Data from the renewal program, however, will not be available before July 1965.

PUBLICATIONS AVAILABLE

Airline Transport Pilot (Helicopter) Written Examination Guide	$.30
Airline Transport Pilot (Airplane) Written Examination Guide	.35
Radiological Protection and Decontamination of Civil Aircraft	.65
Airworthiness Directives Summary, Part 507, Regulations of the Administrator—yearly subscription	4.50
Commercial Pilot Examination Guide	.65
FAA Air Traffic Activity Fiscal 1962	1.00
Instrument Flight Instructor Examination Guide	.35

Available at prices listed from:
Superintendent of Documents
Government Printing Office
Washington 25, D. C.

Age of the Helicopter on the Rise

Use of helicopters has been growing rapidly in the past few years, and FAA's Airports Service plays a major role in the development of heliports to accommodate the increase.

The number of heliports in the United States increased 47 percent in 1962, and nearly 117 percent during the past two years. In 1960 there were only 316 heliports. The total rose to 465 in 1961 and to 685 during 1962. These figures do not include more than 100 off-shore helistops on oil well drilling platforms, nor several hundred heliports in national forests used by the U. S. Forest Service in fire fighting and protection work.

Heliports have sprung up at motels, hospitals, industrial plants, atop city office buildings and other locations where rapid, easily accessible transportation is needed. Between 1960 and 1962, the number of operators increased from 269 to 446, and the number of helicopters rose from 701 to 1,021.

Selection of heliport sites includes much more than just picking out a small area for a takeoff and landing pad. It involves consideration of obstructions adjacent to the site, approach-departure paths, public protection methods, air traffic patterns and potential for further economic development.

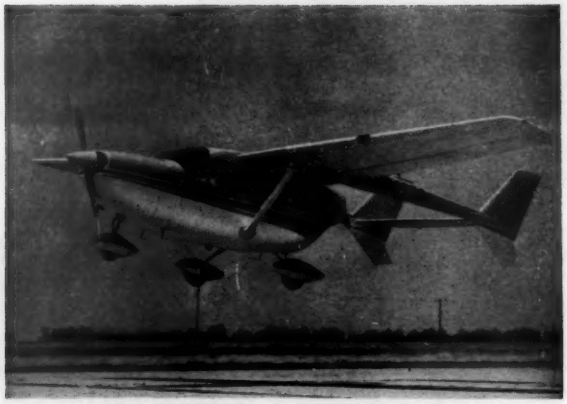
In addition, site selection includes consideration of a minimum time and cost factor in terms of surface travel to the heliport, for helicopter service loses its advantage of accessibility in proportion to the amount of travel necessary to reach the site. Other factors taken into consideration for maximum benefit are zoning ordinances, provisions to prevent encroachment in operational areas and special obstruction clearances.

In all these areas FAA's Airports Service provides a helping hand, in addition to financial assistance given through the Federal Aid Airport Program. FAA's district airport engineers and others in the Airports Service offer advice on approach-departure paths, air traffic patterns, obstruction clearances, public protection methods, pad construction, zoning recommendations and other facets of development and operation.

Many communities and business firms have been quick to realize the advantages of helicopter service. Some cities have already surveyed their areas for suitable sites. Many facilities are being established while other proposed sites are being reserved for future devlopment. Proper zoning regulations are enacted to insure site development as required. Private business and industrial firms have become aware of the advantages of developing heliports, not only for their own use but also for customers, suppliers and neighbors.

Perhaps one of the best illustrations of the emphasis placed on helicopter transportation is the use to which it is put by the President of the United States. The President is a frequent user of helicopter service, both for his own transportation and that of important visitors to the Nation's capital. And the heliport most often used (*right*) is on the south lawn of the White House in the heart of Washington.

More and more heliports are beginning to dot the U. S. landscape as this new and convenient mode of aerial transportation comes into its own. Heliport approach areas are planned to FAA specifications that avoid obstacles projecting into field of vision extending outward and upward from the edge of the touchdown area at the slope of eight to one *(above)*. The approach path comprises at least two zones in line with prevailing winds, consistent with the requirement to avoid obstacles. These approach and departure paths need not be in a straight line, but can be curved or irregular. Most heliports are at least 1½ to 2 times the size of the main rotor diameter. FAA's standard heliport day marker *(opposite page)* is 32-ft. triangle so orientated that the solid apex points to magnetic north. "H" is centered.



SAFETY FIRST

Aircraft Tires

Two simple rules are the key to safe and efficient use of aircraft tires—frequent inspection and proper inflation.

It may not be necessary to inspect tires daily, as airlines do, but at least they should be inspected often, and that means each time the aircraft is used.

In inspecting, look for cuts, bruises, wear, bulges, foreign objects imbedded in the tire and any other signs of abnormal condition. Do not repair tires if they have a flex (sidewall) break or have bead injuries which extend more than three plies in a tire having 16 or more plies, or into 25 percent or more of the plies on all other tires. Tires also are beyond repair if there is evidence of separation between plies or around beads, injuries requiring reinforcement, or kinks or broken beads.

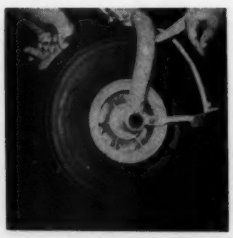
Of equal importance is proper inflation. Keep tires at the pressure recommended for the aircraft by manufacturer. If tires are under-inflated, their sidewalls will break down excessively. Over-inflated tires will show abnormal crown wear. If tubeless tires are under-inflated, the seal against the rim will break, causing leaks.

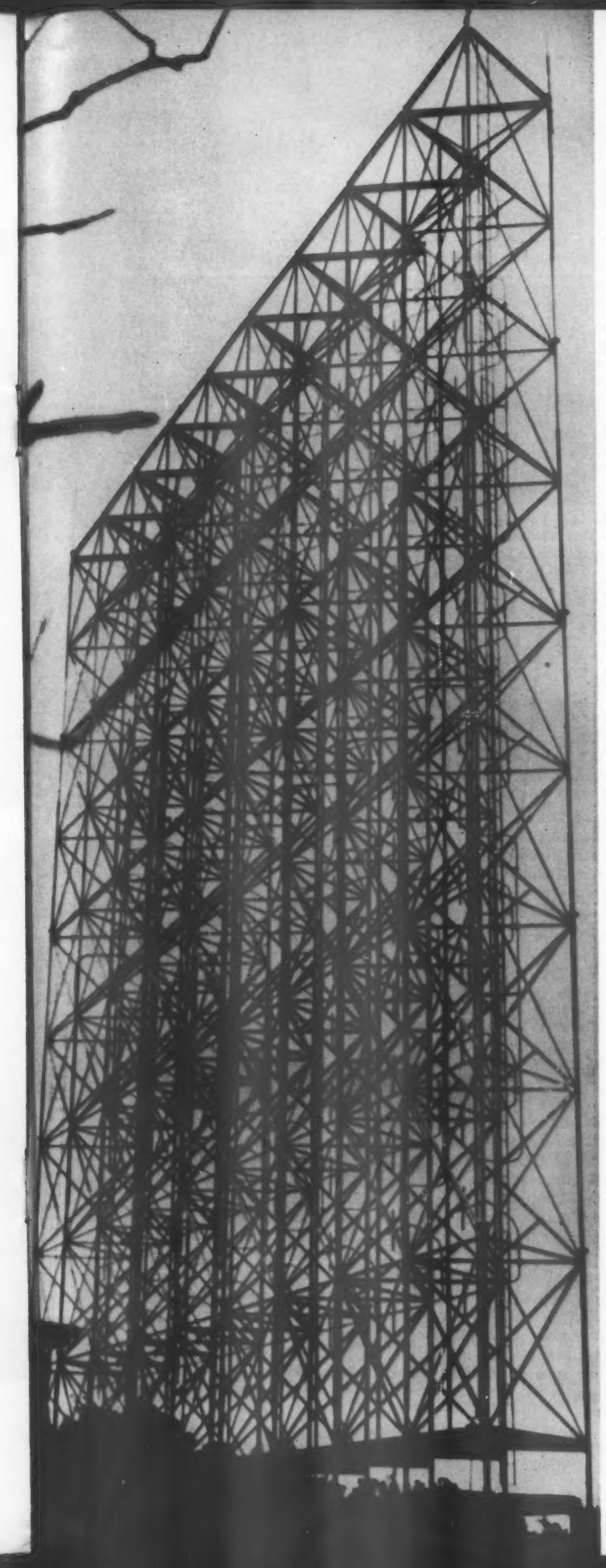
Another factor in tire wear is proper wheel balance. Unbalanced wheels result in uneven tire wear and, in addition, cause vibration which can cause damage to other parts of the aircraft.

Some tires have a color tracer or color thread imbedded in the carcass. When the tire wears to a certain point, the color tracer gives visual indication that it is time to recap, retread or get a new tire. If the tire has no color tracer, a tread worn smooth is a signal for similar action.

If the casing is in good condition, the tire may be recapped or retreaded by one of three generally accepted methods—top capping, full capping or retreading.

But whether it is new tires, recaps or retreads, the aircraft owner who inspects his tires frequently and keeps them properly inflated will find it is a longer and safer interval between times to "retire."





Test Facility Aims for a Big Boost in Radio Range

An FAA experimental radio facility that includes a giant high-gain antenna has been installed on Cape Cod, Mass., in an effort to extend substantially the range of communications between ground stations and aircraft aloft.

This equipment, it is hoped, will be able to attain ground/air communications ranges up to 600 miles after extensive testing and development work. The range of very high frequency (VHF) equipment in use today seldom exceeds 200 miles under normal conditions.

The very high frequency antenna, painted a conspicuous orange and white, stands 110 feet high and 100 feet wide. By comparison, a standard "whip" or dipole antenna stands about three-and-a-half feet atop a tall pole or tower.

Along with the antenna, the experimental facility includes improved transmitter and receiver units.

In both transmission and reception, the experimental system provides large increases in signal strength or gain. The gain in transmission is 24 decibels; in reception it is 33 decibels. The standard antenna system in operational use provides a gain of approximately 2.15 in both transmission and reception.

An FAA crew recently commenced ground/air testing at the new facility, which is located near the town of Barnstable, Mass. Two Agency test airplanes and several Pan American World Airways airliners on scheduled flights have taken part in the testing to date. The FAA planes were a Grumman Gulfstream and a twin-engine Beechcraft. FAA's KC-135 test aircraft is slated to join the tests starting in April.

Airborne equipment of higher performance than standard is used in the FAA aircraft and some of the Pan American aircraft.

Another VHF experimental facility will enter the program in April. This second communications test system will be placed in test service at Palmer, Puerto Rico, near San Juan. The site of this second facility is now under development.

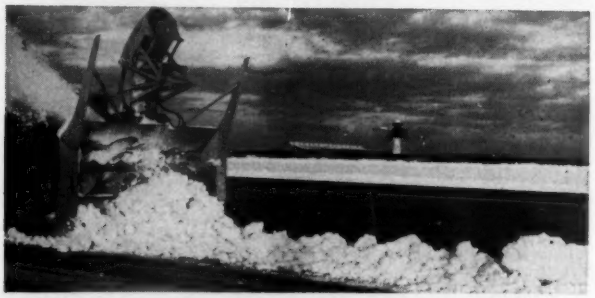
The test program from these two locations is currently scheduled to July 1. Testing goals are both increased range and development of improved equipment. Factors to be evaluated will be range of transmission and reception, signal strengths and intelligibility and equipment reliability.

Major contractors in the program, conducted by FAA's Systems Research and Development Service, are Page Communications Engineers, Washington, D. C., and Ling-Temco-Vought, Dallas, Tex. Page put up the experimental antenna system. Ling-Temco-Vought supplied the system's high-power transmitter.

The Cape Cod facility is valued at $300,000. Cost of the prototype antenna was $150,000.

Dulles Snow Equipment Reflects Modern Approach

Efficient rotary snow blower chews up snow, blows it up to 150 feet away.



Close-up rotary snow blower (above) shows auger in front. Below, snow plow with roll-over blade is versatile machine. *Photos by Reynolds & Co.*

Following the progressive pattern at Washington's new jet airport, the snow removal equipment at Dulles International is all new and of the latest design.

Although it doesn't snow as frequently and as much in the Washington, D. C., area, as it does in some other parts of the country, snow removal still can be a difficult problem. Snow around the Nation's capital is often mixed with sleet, drizzle and freezing rain, resulting in slush and ice layers which can be extremely tricky to remove.

In order to insure efficient and speedy removal, a variety of equipment is required. Dulles presently has six different types of equipment totaling 28 pieces, ready to move snow, slush or ice from runways, taxiways, aprons and interior roads. More will be ordered at a future date when funds become available.

Perhaps the most impressive piece of equipment is the rotary snow blower. This is a heavy duty, all-wheel drive truck with a double auger in front that draws in snow which is blown through a chute for distances up to 150 feet in any desired direction. Especially effective in drifts or snow banks, this unit moves along the runway at an everage speed of about 10-15 mph, and has the advantage of being able to cast snow beyond runway perimeter lights. There are three of these rotary snow blowers at Dulles, each capable of handling 3,240 tons of snow per hour.

Another type of equipment is the truck-mounted heavy duty snow plow with a roll-over blade. This blade can be reversed to plow from one side to the other, while the truck is still in motion. The high-speed tapered blade is designed for runway plowing up to 35 mph. The truck is identical to that used for the snow blowers, and also has a dump truck body which increases its versatility. It plows a swath of snow ten feet wide. There are six of these at Dulles; three are equipped with leveling wings to add extra width to the swath and to push back snow banks.

One of the most useful pieces of equipment is the power broom. It can be used not only to remove light snow and slush, but also water, sand and debris. It consists of a revolving steel brush, 3-feet in diameter and 14-feet wide, and a high-velocity air blower. Debris not swept up by the broom is removed by the blower blast. Most effective for use near the flush-mounted runway lighting, this unit is towed by a truck or a truck plow at speeds up to 25 mph. There are six of these at Dulles Airport.

At the other end of the speed spectrum, but still effective, is the motor grader. Typical of those seen along highways, one large and one smaller grader are used to clear snow along the interior airport service roads, including those used by the mobile lounges and baggage carts.

To remove snow stacked in piles, the front end loader is used—a four-wheel tractor with a snow bucket up front. There are four of these at Dulles, three with a 3-cubic yard capacity and the fourth with a 1¾ yard loader.

Work horse of snow removal equipment at DIA is the dump truck. All seven at DIA have blades up front to push and plow snow. Of standard highway type, these trucks also are used to pull the jet brooms in addition to carrying sanding units to cover icy spots.

Facilities Program Heeds General Aviation Needs

Nearly 12 percent of FAA's current $113.1 million program to install new navigation and traffic control facilities and equipment is devoted mainly to the needs of general aviation.

More than one-tenth of the money—approximately $13 million—is programmed for airport traffic control towers. This includes $3.5 million for the relocation and construction of towers at eight locations that now have air traffic control tower service. Equipment will be installed at an approximate cost of $500,000 at three other air traffic control towers provided by the airport sponsor. In addition, $9 million will be used to construct new air traffic control towers and to establish air traffic control service at locations which now qualify. To qualify for tower service, an airport must have a minimum of 24,000 itinerant operations in a year, excluding purely local operations.

This is the initial program undertaken by the FAA to construct towers in accordance with the FAA standard design for air traffic control tower structures. This design will be adapted to meet the airport's needs and can be expanded to keep pace with increasing airport activities.

Direction Finding equipment will be installed at 113 locations across the nation at a total cost of $3,201,420. This VHF/UHF equipment will serve both VHF-equipped civil aircraft and UHF-equipped military aircraft. It is used primarily to assist lost or disoriented pilots by electronically measuring the bearing of radio signals from the aircraft and establishing its direction from the station. With this information, FAA air traffic personnel can guide pilots either back on course or to the nearest airport.

Twelve Flight Service Stations will be expanded and equipment rearranged for a total cost of $892,900. This is to accommodate increasing general aviation flying—an estimated 13.3 million hours in 1962 and expected to grow to 17.1 million hours by 1968—and the resultant increase in flight following service and other assistance provided for general aviation pilots.

The remainder, and largest part, of the $113.1 million facilities and equipment program can be of equal benefit to general aviation, airlines and military—depending on pilot capability and airborne equipment. Some of these major installations are:

- Radar information from seven military radars and one FAA radar will be remoted to five Air Route Traffic Control Centers to plug existing radar gaps and provide more efficient radar control.
- Weather Bureau radar information will be remoted for the first time to 20 towers to enable controllers to route airplanes around potentially dangerous weather conditions.
- Thirteen long range radar locations will receive new and improved radar antenna reflectors, with radomes (*see* page 7), to reduce ground clutter on radar scopes and improve high altitude coverage.
- Air Route Traffic Control Radar Beacon Systems will be installed at 35 Airport Surveillance Radar locations to provide positive identification of radar targets on the scopes and to reinforce target signals.
- Video Mapping Equipment will be provided at 68 long range radar displays in Air Route Traffic Control Centers. For simultaneous display with radar target information, video mapping is an electronic method of showing airway structure, restricted zones, geographical fixes, and other map data needed for high altitude positive air traffic control.
- VORTAC facilities are programmed for installation at 53 locations; numbers and locations will be determined after coordination with the military.
- Fifty VORs will be converted to VORTAC stations to add UHF direction and distance measuring capability to the facility in conformance with the international standard for en route short range air navigation aids.
- Partial Instrument Landing Systems (ILS), such as localizers, outer markers and compass locators, will be established at four locations to facilitate air traffic movements and increase approach safety.
- Six ILS Backcourse Compass Locators will be established at five airports to provide an ILS backcourse approach and departure procedure and an additional aid for terminal air traffic control.
- Waveguide Localizers will be installed at 13 existing ILS systems where conventional localizers provide marginal or unsatisfactory course direction caused by reflection and/or reradiation from surrounding terrain or structures.
- Marker and beacon facilities will be established at five locations.

New Sport Jumping Rules

A new Federal Aviation Regulation governing sport parachute jumps becomes effective this month.

The rule (FAR Part 105) makes parachutists, as well as pilots, responsible for the safe conduct of non-emergency jumps. Previously, only the pilots of aircraft which drop the chutists had this responsibility.

Non-emergency jumps over congested areas and open-air assemblies are prohibited except when authorized by FAA. Jumps made at airports with FAA control towers require authorization from the tower. Those made in other controlled airspace, such as the Federal Airways, require authorization from the appropriate air traffic control facility.

The rule also prescribes visibility standards for sport parachuting, prohibits jumps through clouds and requires adequate lighting on night drops.

U. S.-Foreign Aviation Experts Exchange Aeronautical Views

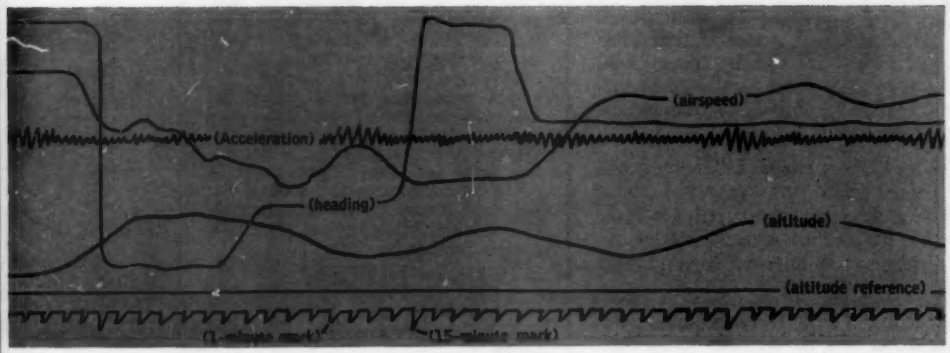
FAA is host to an estimated 1,200 visitors each year in a program to exchange aeronautical ideas with foreign nations.

Aviation representatives from foreign lands spend up to three weeks each year visiting FAA facilities in both Washington headquarters and in the field for briefings and to observe activities. Many visitors, who include high officials in FAA's counterpart organizations in other nations, tour major services and offices. Others whose fields may be more specialized, restrict their programs to particular services, such as Flight Standards, Air Traffic, Research and Development, or Airports. While in the U. S. they study FAA's programs, missions and accomplishments, and are able to carry home suggestions and ideas for use in their own aviation systems.

In addition to the visitor program, FAA maintains a liaison exchange program with other nations in its Systems Research and Development Service. FAA representatives spend two years overseas working with their counterparts, while officials from other nations are assigned to a two-year tour of duty here.

At present, the United Kingdom is represented here by a four-man research and development liaison mission headed by retired Wing Commander H. I. Wood. Also here in the exchange program is B. A. Arad, deputy director of civil aviation for Israel. FAA has four exchange representatives on duty in England and Germany. Scheduled to arrive here in June are German and French exchangees.

Flight Recorder Changes Guesswork into Fact



The aircraft flight recorder is to modern day accident investigators what the magnifying glass was to Sherlock Holmes.

The unit provides a continuous record of such basic flight data as barometric altitude, indicated air speed, vertical acceleration, compass heading and elapsed time. This information, permitting the complete flight path of an aircraft to be reconstructed, is highly valuable in the investigation of accidents and such incidents as near mid-air collisions requiring evasive action, aborted takeoffs and missed approaches.

Flight data is recorded by stylus engravings on a thin ribbon of aluminum foil or magnetic tape. Separate traces record the items of information and these may be distinguished from one another by their pattern and position on the tape. A spool of tape lasts from 125 to 200 hours, depending on the recorder model.

At present, FAA requires flight recorders on all civil turbine-powered aircraft—turboprops as well as the pure jets.

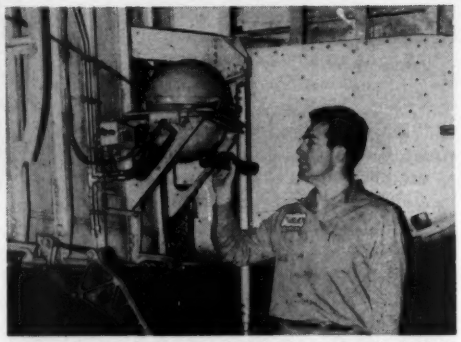
When an aircraft equipped with a flight recorder is involved in an accident, the tapes are analyzed by experts from the Civil Aeronautics Board which has responsibility for determining "the probable cause." A transparent glass overlay may be used to obtain a quick preliminary reading or to locate flight segments of particular interest. The overlay has four scales for reading altitude, airspeed, vertical acceleration and heading. A time index on the tape relates the four functional traces to elapsed time.

The final analysis is now being performed on a new $15,000 CAB machine designed especially for the job. Tapes are scanned by a power-driven optical system, magnified 20 or 50 times, and projected on a small viewing screen mounted on the console. Measurements to the nearest 10,000ths of an inch are made automatically along both the horizontal and vertical axes and presented visually on digital counters. This data also may be fed directly to a print-out or card-punching machine for use in a computer.

Flight recorders currently in service with U. S. airlines include models manufactured by Lockheed Aircraft Service, United Data Control, Fairchild Camera and Instrument Corp., and Spec Tool Co.

The Lockheed Aircraft Service Model 109C is one example of the recorders in use today. To provide maximum crush resistance and fire protection, the mechanism for this unit is housed in a spherical-shaped metal casing consisting of an inner and outer shell separated by a thick layer of thermal insulation. FAA specifications require that the tapes must be able to survive an impact of 100 G forces, temperatures of 1100 degrees Centigrade and immersion in salt water for 36 hours.

The entire unit weighs approximately 32 pounds and has a horizontal diameter of 13 inches and a vertical diameter of 15 inches. It usually is painted with Skydrol-resistant orange-yellow paint to facilitate recovery in the event of an accident.



Lockheed Aircraft Service Model 109C, typical of flight recorders currently in service, is installed in wheel well.

This battered recorder was recovered from a Viscount turboprop which crashed near Baltimore on November 23, 1962. *Below* is the CAB's machine for analyzing tapes.

Letters to the Administrator

FAA

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. Please keep them brief. No anonymous letters will be used, but names will be withheld on request.

• Foreign Pilot's License

I am a student in this country from India with a private pilot's license issued by the Director General of Civil Aviation, New Delhi. It is valid for a Piper PA-18, Sentinel L-5 and a Tiger Moth. I have logged 98.2 hours including instrument flying and solo cross country flying. I also hold a radio telephone operator's license issued by the Ministry of Communications, Government of India.

I would like clarification of the requirements in *Civil Aeronautics Manual 20* concerning the Special Purpose Pilot Certificates for foreign pilots.

O. M. Ganapathi Raj
Eugene, Ore.

As a citizen and licensed pilot of India, you may obtain a Special Purpose Pilot Certificate for maintenance of pilot proficiency by presenting your current Indian pilot license, evidence that you meet the appropriate physical standards, and a record of your pilot flight time—and by passing a brief examination on U. S. air traffic rules. A current Indian medical endorsement or certificate, or a U. S. medical certificate, will be acceptable as evidence of physical qualifications.

You may take the required written examination at the Portland General Aviation District Office, or elsewhere in your area by appointment. Parts 43 and 60 of the Civil Air Regulations *and Part 320 of the* Regulations of the Civil Aeronautics Board *will provide the information needed to prepare for the examination.*

We have asked the Federal Communications Commission to send you application forms for obtaining a radio license. To be eligible for one, you must hold a pilot certificate issued by the FAA.

• Pilot Certification

I am buying a small Cub and woud like information on the minimum license required to operate such a plane.

William F. McGinn
New York

At least a valid student pilot certificate, appropriately endorsed by a flight instructor, is required to operate an aircraft solo.

To carry passengers, the pilot must hold at least a valid private pilot certificate with appropriate ratings for the aircraft to be flown.

Application forms for a medical certificate are provided only by FAA designated medical examiners.

All other application forms related to pilot certificates are available at any FAA General Aviation District Office.

• Glider Flight Rules

I would like an official interpretation of FAA Regulation Part 61.93 (b) (2). Does the phrase "30 glider flights in which aerotows are used . . ." mean 30 solo flights or 30 flights either dual or solo in any combination? I believe a number of flight checks are being delayed because of confusion on this point.

Kenny C. Danielson
Inglewood, Calif.

The regulation prescribing "at least 30 glider flights in which aero-tows are used," may be considered as a minimum of 30 flights consisting of any combination of dual and solo flights.

• Airport Bird Problem

I have read of the fatal airplane crashes caused by birds, and feel that something must be done to prevent this from happening again. I have a suggestion that may save lives.

Birds have warning signals that they use to let other birds know danger is near. I am an electronics technician and feel that these sounds can be reproduced via electronics to keep all birds away from airstrips. If speakers were placed at the ends of the runways and at the outer perimeter of the airport and the sounds were sent at intervals, I believe this would cut the danger of birds flying or being sucked into jet engines.

George Schaefer
Cheektowaga, N. Y.

FAA is engaged in a thorough study to determine the feasibility and value of several methods of ridding airports of this hazard. One of the tests involves the use of high frequency sound waves of varying pitch. These sounds are intended to drive away the birds from landing and takeoff zones. The Fish and Wildlife Service, U. S. Department of Interior, under contract with this Agency, is studying the sound factor as well as others, including migratory habits, feeding grounds, etc., in an effort to eliminate all dangers of birds to aircraft. Other variables on the sound study include shotgun blasts and recordings of bird distress calls.

• Integrated Instruction

I believe clarification is needed regarding requirements for solo flight. Part 61.63 gives no requirement for instrument proficiency whatsoever. On the other hand, Part 61.85 (a) (5) specifies instrument instruction must be integrated with the flight instruction in primary flight maneuvers given before and after solo. It seems, too, that the day is past when a flight instructor should be permitted to certify for solo cross-country a student whose dual experience is limited to pilotage and some dead reckoning, without benefit of radio or instrument flight techniques.

Frederick J. Wright
Toledo, Ohio

A proposal to relocate the regulations prescribing integrated flight was the subject of a recent Notice of Proposed Rule Making. It is now being given final consideration. If adopted, the requirement would then be transferred from Federal Aviation Regulations *section 61.85 (a) (5) to section 61.83 where it would appear as a student pilot requirement for solo. As a result, all student pilots would be required to receive instruction in controlling the airplane by reference to instruments only, before their student pilot certificates may be endorsed for solo.*

Regarding instruction in radio navigation prior to solo cross country, FAR *section 61.85 (b) (5) states: "A student pilot may not operate an airplane in solo flight outside a local area designated by his flight instructor until he has received flight instruction [from an appropriately rated flight instructor] in the proper use of two-way radio communications and VFR navigational procedures and techniques."*

• Sky Diving

I am interested in taking sky diving lessons at a private airfield and would like a form explaining what type of aeronautical physical examination is required and by what type of physician.

C. B.
Boston

Federal Aviation Regulations do not require medical certification to engage in this activity, primarily because sport parachutists are not considered as airmen or certificated as such. The following regulations related to parachutes and their use may be obtained from the Superintendent of Documents, Washington 25, D. C.:

Civil Aeronautics Manual 25 (*Parachute Rigger Certificates*), *15 cents;*

Civil Aeronautics Manual 43 (*General Operations Rules*) *specifying parachutes suitable for emergency use and conditions under which an intentional or non-emergency parachute jump may be made, $1.25;*

Civil Aeronautics Manual 54 (*Parachute Loft Certificates and Ratings*), *10 cents.*

Additional information or assistance may be obtained by contacting the FAA General Aviation District Office in your area.

Cartoonist Robert Osborn reminds us, in his usual place on the next page, that a fundamental piece of aircraft equipment—the radio—is all too often overlooked by pilots or used too late to do them any good.

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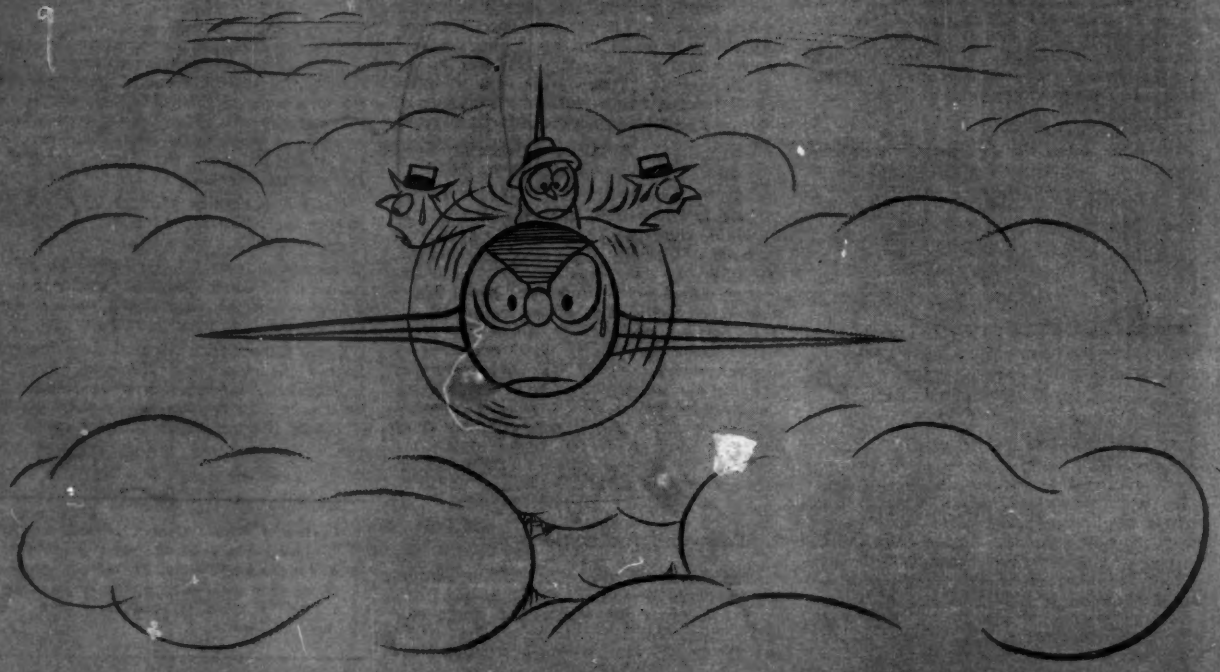
Lost on Top?



Don't wait till fuel is low; call in at once.